DOCUMENT RESUME

ED 039 240 TE 001 835

AUTHOR LaRocque, Geraldine E.
TITLE Sensory Response Patterns of Academically Successful and Unsuccessful Ninth-grade Students of English.
PUB DATE Mar 70
NOTE 13p.; Unpublished paper

EDRS PRICE EDRS Price MF-$0.25 HC-$0.75
DESCRIPTORS *Academic Achievement, *Auditory Perception, *English Education, Grade 9, High Achievers, Low Achievers, Perception, Perceptual Development, Sensory Training, Student Characteristics, *Tactual Perception, *Visual Perception

ABSTRACT

Testing Marshall McLuhan's thesis that the educational system favors the visually oriented student and militates against the audile-tactile youngster, this pilot study attempted to discover whether or not academically successful ninth-grade English students have a different sensory response pattern than unsuccessful ninth-grade English students. Subjects were 50 students from a New York City suburban junior high school, 32 of whom were classified as successful, 18 as unsuccessful. The results of four Sensory Quotient Tests--visual, passive tactile, auditory, and active tactile--were (1) that the successful English students performed significantly better on the visual test, (2) that the unsuccessful students scored higher only on the auditory test, although the difference was not statistically significant, and (3) that the total score of the four tests of the successful students was significantly different from the total score of the unsuccessful students. Also notable was the tendency of both groups to excel in the two tactile modes rather than the visual or auditory, giving some support to McLuhan's thesis that we are moving from a visual, linear culture toward a multi-media one. (Author/MF)

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

ED039240

SENSORY RESPONSE PATTERNS OF ACADEMICALLY SUCCESSFUL AND UNSUCCESSFUL NINTH-GRADE STUDENTS OF ENGLISH

by

Geraldine E. LaRocque
Associate Professor of English
Teachers College--Columbia University

March, 1970

Corrections and suggestions for the revision of this draft are solicited. Not to be quoted, duplicated or cited as a reference without the specific permission of the author.

TE 001 425

Abstract of
"Sensory Response Patterns of Academically-Successful and Unsuccessful Ninth-Grade Students of English"

The purpose of this pilot study was to discover whether or not academically-successful ninth-grade students of English have a different sensory response pattern, as measured by the Sensory Quotient, from unsuccessful ninth-grade students of English. Subjects were 50 students from a New York City suburban junior high school, 32 of whom were classified successful and 18, unsuccessful. The four tests of the Sensory Quotient -- visual, passive tactile, auditory, and active tactile -- were administered to the subjects; and one-tailed *t* tests of the differences between the means were calculated. The three major findings are (1) that the successful English students were more visually oriented ($p < .01$) than the unsuccessful students, (2) that the only test on which the unsuccessful students scored higher than the successful students was the auditory test although the difference was not statistically significant, and (3) both groups had similar profiles with mean scores ranked from highest to lowest on passive tactile, active tactile, visual, and auditory; but the total score of the four tests of the successful students was significantly different from the total score of the unsuccessful students ($p < .05$).

Purpose

The purpose of this pilot study of the sensory response patterns of students of English in the ninth grade was to test Marshall McLuhan's thesis that the educational system favors the visually oriented student and militates against the audile-tactile youngster (McLuhan, 1969). Specifically, the hypotheses tested in the present study were:

I. On the visual test the mean score of the successful students will be higher than the mean score of the unsuccessful students. (Significance level specified in advance for the rejection of the hypotheses was $p < .05$.)

II. The sensory profile for the successful students will show a ranking of scores from highest to lowest in the following order: visual, auditory, active tactile, passive tactile.

III. The sensory profile of the unsuccessful students will show a ranking of scores from highest to lowest in the following order: active tactile, passive tactile, auditory, visual.

Background

Marshall McLuhan in his analyses of media has promulgated the thesis that sensory inputs bias one's sensory life and that both degree of definition and physical intensity play important roles. Since he postulates a tendency for total sensory response to remain constant, he believes that the increased use of one sense reduces the human capacity to respond through other senses (1969).

"Literate, rational, civilized society," according to McLuhan, has been a visual society characterized by isolation of single perceptions and logical visual presentations which are linear and continuous, whereas pre-literate and post-literate societies depend more on auditory space than visual space for their sensory inputs. The switch from visual to auditory space is the result of electro-magnetic media which bombard all the senses at once, resulting in non-linear, interdependent, discontinuous mosaics rather than single impressions. Auditory space is

characterized by increased use of the auditory and tactile channels (McLuhan, 1969).

In order to test some of McLuhan's theses, Daniel Cappon, Professor of Psychiatry at the University of Toronto, and several associates developed a measure of sensory perceptual performance which they named the Sensory Quotient. It consists of four tests administered individually. The four tests -- visual, passive tactile, auditory, and active tactile -- consist of twelve items each (a total of 48 points) gradated from low to high definition. In each item of the four tests the respondent must identify one of four shapes -- a circle, a diamond, a rectangle, or a triangle. Although the Sensory Quotient is explained in some detail in Cappon (1968a), a short description of the revised tests is necessary here:

Visual

The twelve computer-generated geometric patterns are composed of dots surrounded by "noise" of extraneous dots. The embedded patterns (three of each geometric form) range from high definition (little or no "noise") to low definition (much inference, i.e., many dots surrounding the pattern). The patterns are projected for three seconds onto a screen in a darkened room. There is a ten-second interval, timed by a stop watch, between slides.

Passive tactile

The geometric patterns are indented or engraved into metal blocks, approximately $2\frac{1}{2}$" x $2\frac{1}{2}$", definition being determined by the depth of the geometric shape in the block. Each shape has a circumference of one inch. The metal squares were made following rigid specifications. They are fitted into one of two forms which are molded to hold a small or a large hand. In testing, the administrator puts a blindfold on the subject, and then places the respondent's forefinger into the depression with a weight on top, holds it there for the length of time it takes the tester to repeat silently thousand one, thousand two, thousand three. Then the tester asks which of the four geometric shapes is cut into the block.

Auditory

The entire test is on tape with a speaker saying the names of the geometric shapes against a background of high to low definition "noise." The tape was developed under highly controlled conditions; and during the administration of the test, the tester uses a sensitive sound meter to monitor the tape which the subject hears through earphones.

Active tactile

The computer-generated geometric shapes are similar to those used in the visual test and are set in Braille, with high definition being fewer extraneous dots. The sheets are approximately $8\frac{1}{2}$" x 11" with the Braille shapes in the center. The respondent is blind-folded, his finger placed in the center of the shape; and he is given the same amount of time as in the Passive-tactile test to feel the geometric shape with his fingers and tell what it is.

After Daniel Cappon and his associates had created the Sensory Quotient, they subjected it to various reliability and validity checks (Cappon, 1967) after which they conducted a series of experiments which demonstrated that a respondent could improve his score on the test (i.e., learn) merely by retaking the test; however, feedback and another exposure to the test resulted in still higher gains (Cappon, 1968 a).

Subsequent tests made on a fairly homogenous population of a large company indicated that the sensory profile was different in shape and amount for each occupation within the company (Cappon, 1967, p. 29). Particularly interesting is the fact that white collar workers tended to score higher in all modalities than did the blue collar workers. One explanation for the different profiles for different types of workers might be that certain kinds of jobs demanded more use of certain modalities and therefore resulted in higher performance in those modalities

In a still later research effort, Cappon found differences in the sensory responses of a fairly homogeneous population according to their preference for attending sports events, live theater, ballet, musical

concerts, opera, or movies. For example, theater-goers tended to be more intelligent than the other groups, more visual, and more competent in the active tactile and passive tactile modalities; but they were not more competent auditorily. Opera fans tended to be somewhat poor in visual competence and at their best auditorily (Cappon, 1968 b).

Method

The present study hypothesized that academically-successful English students would be more visually oriented than and demonstrate different sensory profiles from unsuccessful students of English. A pilot study was conducted with ninth-grade students in May, 1969, in a suburban New York City junior high school. Consulting the school records, the researchers selected all the ninth graders who had received at the end of three marking periods no fewer than two A's and no more than one B in English; the total number of proficient English students selected was 37. In the same manner all the unsuccessful students in English were selected -- unsuccessful being defined as students who received the following grades: PPP;[1] DEP;[2] EDD; PPE; DEE; DDP; EEP. The total number of poor English students was 38. It was hoped that at least 30 students from each group would be able to complete the Sensory Quotient.

Of the students selected, those who wished to participate in the study and who had their parents' permission were then individually tested on the four modalities by a tester[3] carefully trained to use the

---

1. P meant the student was doing failing work but was trying.
2. E = failure.
3. Mr. John Fanselow, Research Assistant, Institute for Pedagogical Studies, Teachers College, Columbia University.

Sensory Quotient by one of Cappon's associates. Students were summoned from class to the experimental headquarters where the fifteen-to-twenty minute testing took place. Before responding to each test the testee was exposed to one example of the modality in high definition with no "noise" so that he was familiar with the medium and procedure. He was also told not to worry about his performance -- that this exercise is not a test in the same sense that an examination is. The tester and his two assistants believed that the respondents were curious and less worried about how well they were doing than some adults who were used in the practice sessions with the materials.

The same person tested all the participants and the conditions of testing were held constant through written directions and other controls. Further data such as I.Q. score, paragraph meaning score on the New York State Reading Test, and grade-point average in other academic subjects were also collected.

The final number of students in each group was 32 successful students and 18 unsuccessful, the loss in each group being 5 and 20 respectively. The high number of unsuccessful English students who did not take part in the experiment may have influenced the results in an undetermined manner. Of the five non-participating students in the successful group, one did not return his permission slip, two were denied parental permission, and one was absent at the times he was called to be tested. In the unsuccessful group of students, seventeen did not return permission slips, one was denied parental permission, one was absent at the times he was called to be tested, and one left school.

Analysis of Data and Results

When the data were complete, the first calculation made was a one-tailed t test for independent samples of the difference between the mean scores of the successful and unsuccessful students on the four test sections and the Sensory Quotient total. Next, a one-tailed t test of the difference between the means of the academically successful and unsuccessful students was calculated for twelve other variables.

The three major findings of the study are that (1) the successful English students used as subjects in this study performed significantly better ($p < .01$) on the visual test than did the less proficient students (Table I), (2) the only test on which the poorer students performed better than the successful students was the auditory (Table I) although the difference is not statistically significant, and (3) both groups had similar sensory profiles; but the total score of the four tests of the successful students was significantly different from the total score of the unsuccessful students ($p < .05$). On the basis of the data, Hypothesis I can be accepted, but Hypotheses II and III must be rejected.

ANOVA being calculated

Table I

Differences Between Means of Unsuccessful and Successful Students on the Four Modality Tests of the Sensory Quotient

Test	Successful Mean Number: 32	Standard Deviation	Unsuccessful Mean Number: 18	Standard Deviation	t Score
Visual	4.34	2.27	3.39	1.38	2.47*
Passive tactile	7.72	1.92	6.78	2.24	1.57
Auditory	2.69	1.67	3.33	1.53	-1.35
Active tactile	5.19	2.07	4.67	2.11	0.85
Total	20.44	3.66	18.17	4.18	2.00**

df = 48

*p < .01

**p < .05

Tables I and II illustrate the interesting third finding of the study. Although the successful subjects tend to be more visually oriented ($p < .02$) than the unsuccessful subjects, both groups have similar sensory profiles in that they received the highest scores on the passive tactile test,[4] second highest on the active tactile test, the third highest on the visual, and the lowest scores on the auditory. In other words, both groups scored higher in two of the modalities characteristic of auditory space than in the modality of visual space.

Both groups seem to be highly tactile; and although the unsuccessful group tends to score higher than the successful group on the auditory test, the auditory test score is the lowest of the four. This may be partially explained by the lower reliability coefficient for the auditory test as reported by Cappon (1967, p. 22).

Test-retest Reliability Coefficients

Number: 20

Visual	.84
Passive tactile	.73
Auditory	.54
Active tactile	.66

---

4. Since all previous administrations of the Sensory Quotient had been with older students or adults, the tester wondered if the high scores on the passive tactile test were a result of the size of ninth graders' fingers. Is it possible that their smaller index fingers fit into the depressions more easily and therefore more readily recognize the geometric form?

Combining the scores for the two groups on each test, one finds that the results do seem to demonstrate different strengths in the use of the four modalities by the ninth-grade subjects of this experiment. However, such a conclusion is valid only if the four tests are of similar difficulty.

Table II

Means of Successful and Unsuccessful Students

Test	Combined	Successful	Unsuccessful
Passive tactile	7.38	7.72	6.78
Active tactile	5.00	5.19	4.67
Visual	4.32	4.84	3.39
Auditory	2.92	2.69	3.33

Other significant differences ($p < .001$ and beyond) that are not unexpected exist between the successful and unsuccessful English students. The successful group contained more girls, younger students, more intelligent students, students with higher scores on the paragraph meaning section of the reading test, more students of higher socio-economic

status,[5] and students who had higher grade-point averages in math, social studies, and science. Table III indicates that the grade-point average in math, although significantly different for the two groups, does not show as great a difference as the grade-point average in social studies and science.

Table III

Differences Between Means of Successful and Unsuccessful Students on Grade-Point Averages

Grade Point Average for 3 Marking Periods	Successful Mean Number: 32	Standard Deviation	Unsuccessful Mean Number: 18	Standard Deviation	t Score
Math	5.09	0.78	3.39	1.20	6.11*
Social Studies	5.41	0.61	2.56	0.98	12.63*
Science	5.31	0.74	2.72	0.96	10.69*

* For 48 degrees of freedom the probability of obtaining a t score of 3.27 is less than .001. The obtained t score has a much lower probability of occurring.

The findings of this study seem to indicate that these ninth-grade subjects tended to excell in the two tactile modes rather than the visual or auditory, giving some support to McLuhan's thesis that we are moving toward a multi-media culture from a visual, linear one. His belief that the educational system is biased toward the visually oriented and that the school dropout tends to prefer the auditory mode is not

5. Using the father's occupation, the researchers ranked socio-economic status as low, middle, and upper-middle using the Scores for Categories of Major Occupation Groups of the Bureau of the Census (See bibliography). A rank of upper middle was given to the Bureau of Census scores ranging from 81-90, middle from 45-80, low from 0-44. Three ranks were reassigned after checking them against the address of the subject and school personnel's knowledge of the subject's area of residence.

completely borne out by the research although the unsuccessful students did score somewhat higher in the auditory mode than the successful ones. The fact that successful students perform significantly better on the visual test than do the unsuccessful students may indicate that English is a highly visual subject taught in a primarily visual manner, or it may be that prior conditions such as socioeconomic status, sex, or intelligence influence performance in reading, performance in school, and performance on the Sensory Quotient.

Since the unsuccessful students performed better than the successful students only on the auditory test, one may assume that perhaps more attention to that mode should be given in English classrooms where there are numbers of unsuccessful students. However, one cannot state that the unsuccessful student prefers this mode when it ranks fourth in performance, as it does with the successful students, and when there is no significant difference between the stated preferences for each group.

Should the results of this pilot study into sensory responses of ninth-grade English students be verified with a larger population and the tests themselves proved of comparable difficulty, then researchers will, no doubt, want to look at the sensory responses of students in other fields, and at the responses of their teachers. Still later investigation might be characterized by intervention employing primarily one mode or another to ascertain its effectiveness with certain types of students, teachers, and subject matter.

BIBLIOGRAPHY

Bureau of Census. Methodology and Scores of Socioeconomic Status. Working Paper #15. Washington, D.C. : U.S. Department of Commerce, Prepared for Use in the 1960 Census of Population.

Cappon, Daniel. "The Birth of a Test Called the Sensory Quotient." Toronto, 1967. (Xeroxed.)

Cappon, Daniel, Banks, Robin, and Ramsey, Craig. "Improvement of Recognition on a Multi-modal Pattern Discrimination Test," Perceptual and Motor Skills, Vol. 26 (1968), 431-441. (a)

Cappon, Daniel. Study on Sensory Profile in the Performing Arts. A Report to the Canada Council. Prepared by the University of Toronto Committee on Theater Study. Toronto, 1968. (b)

McLuhan, Marshall. "Problems of Communicating With People Through Media," The McLuhan Dew-Line, Vol. I, No. 9 (March, 1969), Section I.

McLuhan, Marshall. Understanding Media: The Extensions of Man. New York: McGraw-Hill, 1964.